Remarks

Claims 21 - 39 are pending. Favorable reconsideration is respectfully requested.

The subject invention is directed to low modulus sealants produced by chain extension of α,ω-silanol-functional organopolysiloxanes by α-aminomethylalkyldialkoxysilanes. The latter, due to only a methylene group between the electronegative nitrogen atom and the silicon, are exceptionally reactive alkoxysilanes. These alkoxysilanes react extremely rapidly with any substances bearing -OH groups, including the α,ω-disilanol polymers, water, and alcohols. Thus, as taught by JP 63-83167, these compounds not only act as chain extenders, but also act as water and alcohol scavengers. On page 6 of JP '167, for example, it is stated that the amount of α-aminomethylalkyldialkoxysilane is calculated on the basis of the molecular weight of the silanol, as well as "the amount of components (for example, the water content of a filler) which can react with the (B) component [aminomethylalkyldialkoxysilane] other than the (A) component [α,ω-disilanol]."

However, JP' 163 hints at some problems with such compositions, since while caulks and sealants are most desirable as single component ("RTV-1") compositions, JP '163 mentions possible use of two and three component (RTV-2, RTV-3) compositions. Applicants have found that while aminomethylalkyldialkoxysilanes serve admirably as chain extenders, as taught by JP '163, and form low modulus sealants, they unfortunately suffer from severe storage problems.

The reason for the storage instability is not known for certainty. Because of the very high reactivity of the aminomethylalkyldialkoxysilanes, it is believed , as taught by JP '163, that all hydroxyl compounds in the composition, including water and alcohols, will have reacted. The aminomethylalkyldialkoxysilane functions as a scavenger in addition to a chain extender.

Chung U.S. Patent 4,495,331 ("*Chung*") discloses that hydroxyl compounds such as water and alcohols decrease the storage stability of conventional RTV-1 compositions. *Chung* also discloses that nitrogen containing silicon compounds have been used in the past to scavenge water and hydroxyl groups from such compositions. See column 1, lines 45 - 55. *Chung's* improvement over the art is the substitution of reactive non-silicon compounds as scavengers, for example organic isocyanates. However, to be effective, these isocyanates must be present in at least stoichiometric amounts relative to water and alcohol present. Moreover, since amino groups react much more rapidly with amino groups than with water or alcohols, compounds containing primary or secondary amino groups must be absent when the isocyanate is added, as it will react first with the amino compounds. Amino compounds which are frequently added to RTV-1 compositions are aminopropyl- and aminoethylaminopropyltrimethoxysilanes, as adhesion promoters. If these are added to the composition before or after addition of the isocyanate, the isocyanate will react and will no longer be available as a scavenger.

Applicants have very surprisingly discovered that very small quantities of isocyanates, when added to compositions containing α,ω-dihydroxy-functional organopolysiloxanes and also containing α-aminomethylalkyldialkoxysilanes as a chain extender, render the compositions storage stable. The isocyanates apparently deactivate whatever mechanisms cause storage stability problems in these compositions, such as those of JP '163.

The isocyanates cannot act as scavengers, since first, the α-aminomethylalkyldialkoxysilanes will already have scavenged all water and free hydroxyl groups, and second, the isocyanates are added in too low a quantity to act as a scavenger. Moreover, addition of adhesion promoters such as aminopropyltrimethoxysilane would immediately react with any free isocyanate, rendering it unavailable for any purpose. Yet such adhesion promoters can be added, as in Applicants' examples with the composition remaining storage stable.

The prior claims had been rejected over JP '167 in view of *Chung*. It is the position of the Office that one skilled in the art would be motivated to add the isocyanate water scavengers of *Chung* to the composition of JP '163. Applicants find no such motivation, however, because as taught by JP '167 and well known in the art, the α-aminomethylalkyldialkoxy silanes are so reactive that this component of the composition will scavenge all water and hydroxyl groups present. Therefore, there is no need to add any scavenger.

The Office states that "*Chung* teaches the incorporation of the organic isocyanate after the mixing of the silanol terminated polysiloxane and an alkoxysilane compound (Example 2), obviously, in order to chemically combine with the hydrolysis-condensation byproducts. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the organic isocyanate in the composition of JP '167 . . . ."

This surmise on the part of the Examiner is clearly incorrect, however. In the *Chung* compositions, the silanol is reacted with alkoxysilane such as methyltrimethoxysilane to provide a polymer with dialkoxy end groups. *Chung* did not use the very reactive α-aminomethylalkylakoxysilanes of JP '167. While the conventional alkoxysilanes react slowly and reversibly, the very active α-aminomethylalkyldialkoxysilanes react very rapidly and essentially irreversibly. Hence, the presence of the small amounts of alcohol in the product would not be expected to make any difference in a JP '167 composition, and again, there would be no need to add any isocyanate.

Finally, if isocyanate were added, it would have to be added in an amount which would react with the alcohol present. In the present invention, the amount of isocyanate added is far too small for this. In Example 5, for instance, the amount of isocyanate added is only 0.02% based on the weight of the non-filler components, while in Example 1 it is 0.2%. By contrast, in *Chung*, 0.5% was found not to be effective, with a doubling of the viscosity at

100°C for 24 hours, while at 1.0 weight percent, the viscosity remained unchanged and at 1.5%, actually decreased.

Claims 25, 29, and 32 require also the addition of an aminoalkylalkoxysilane adhesion promoter. Since an isocyanate cannot be used with such a compound and still scavenge less reactive water and hydroxyl groups, one certainly would not be motivated by *Chung* to add isocyanates to such compositions.

Certain claims had been rejected over JP '167 in view of Finger et al. U.S. 6,254,811 ("*Finger*") and *Chung*. Applicants respectfully traverse this rejection. *Chung* is very clear that his compounds are substantially acid free. However, former claims 18 - 19 (now claims 33, 34, and 37) require an acid. *Chung* teaches directly against such compositions. These claims are therefore clearly patentable.

Applicants submit that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, the Examiner is highly encouraged to telephone Applicants' attorney at the number given below.

Respectfully submitted,

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